the relative humidity rose rapidly from 63 to 98. The barograph recorded an abrupt rise in pressure from 29.55 inches to 29.63 inches, and continued to rise uniformly thereafter, attaining a pressure of 29.80 inches at 8:00 a. m., July 7. In the midst of the heaviest rainfall the wind attained a maximum velocity of 40 miles per hour at 4:50 p. m., at which time the wind backed from southwest to southeast, indicating that the center of the storm had passed probably on the south, since the squall wind usually blows out from the region of heaviest rainfall. Three minutes later, the wind veered to northwest from which direction it continued to blow for several hours after normal conditions were again restored. The rainfall during the first 17 minutes was 1.03 inches, of which 0.77 inch fell between 4:45 and 4:55 p. m. The rain continued till 5:30, giving a total of 1.24 inches for the storm. Other thunderstorms occurred in eastern Pennsylvania, New Jersey, and New York, but no rain fell at Baltimore or Washington.

The surface wind July 7 at 7:00 a. m. was north and at 1,100 meters northeast; conditions associated with an extensive HIGH over the Great Lakes.

## PRELIMINARY MEETING OF OFFICIAL WEATHER BUREAU DIRECTORS AT LONDON, JULY 3-9, 1919.

By Dr. L. A. BAUER.

Department of Terrestrial Magnatism, Carnegie Institution of Washington.

[Dated Sept. 1, 1919.]

At the call of Sir Napier Shaw, the president of the prewar International Meteorological Committee, there was recently held in the Meteorological Office, London, from July 3–9, a preliminary meeting of such of the official weather bureau directors who could attend at short notice and who represented the allied and neutral countries. The prime purpose of the meeting was to reach some preliminary agreements, in advance of the proposed Paris Meteorological Conference meeting at the end of September, regarding official meteorological matters and interchange of data.

There were present Sir Napier Shaw, chairman, A. Angot (France), Lieut. Col. E. Gold, of the Meteorological Office, who served as secretary, E. Van Everdingen (Holland), Lieut. H. D. Grant (British Admiralty Meteorological Office), Th. Hesselberg (Norway), L. Palazzo (Italy), Capt. C. Ryder (Denmark), G. T. Walker (India), A. Wallén (Sweden), and L. A. Bauer, representing C. F. Marvin (United States).

The signal success of the meeting was due chiefly to Sir Napier, under whose tactful and skillful management decisions on many matters were put in form for submission to the coming Meteorological Conference at Paris. Entire harmony prevailed throughout the deliberations, the representatives of the various countries having free and cordial intercourse with one another.

Among the pleasant social events may be mentioned the visit to the Kew Observatory on the afternoon of July 3, and reception in the evening at the Meteorological Office; dinner tendered by the Meteorological Office at Bailey's Hotel, July 7; visit to W. H. Dines' observatory at Benson, July 8.

## MEETING OF INTERNATIONAL UNION OF GEODESY AND GEOPHYSICS AT BRUSSELS, JULY 18-28, 1919.*

By Dr. L. A. BAUER.

Director, Department of Terrestrial Magnetism, Carnegie Institution of Washington.

[Dated Washington, Sept. 1, 1919.]

Under the auspices of the International Research Council there was established at Brussels, during the meeting of the Council in the Palais des Academies, July 18–28, 1919, various unions on Astronomy, Mathematics, Physics, Chemistry, Geodesy and Geophysics, and Scientific Radiotelegraphy.

The various countries, formerly at war with the Central Powers, were, in general, fully represented by officially appointed delegates. At the last session of the Council a resolution was passed respecting the entrance of other countries and the invitations to be extended to them.

The International Union of Geodesy and Geophysics, as finally established for a period of 12 years beginning on January 1, 1920, consists of the following sections:

(*a*) *Geodesy:* William Bowie (United States), president; Vicenzo Reina (Italy), vice president; Lieut. Col. Perrier (France), secretary and director of Central Bureau.

(*b*) *Seismology:* Owing to continuation of present agreement among countries with regard to the International Seismological Association, which is to continue for some time longer, it was not possible to organize this section definitely.

(*c*) *Meteorology:* Sir Napier Shaw, president; A. Angot, vice president; C. F. Marvin, secretary and director of Central Bureau.

(*d*) *Terrestrial Magnetism and Electricity:* A. Tanakadate (Japan), president; C. Chree (England), vice president; L. A. Bauer (United States), secretary and director of Central Bureau.

(*e*) *Physical Geography:* Naming of president deferred until entrance of neutral countries; H. Lamb (England), vice president; G. P. Magrini (Italy), secretary and director of Central Bureau; Sir Charles Close (England), and Mr. G. W. Littlehales (United States) were made members of the executive committee, in addition to president, vice president, and secretary.

(*f*) *Volcanology:* Prof. A. Riccò (Italy), president; H. S. Washington (United States), vice president; Dr. A. Malladra (Italy), secretary and director of Central Bureau.

The following officers of the Union were chosen: Charles Lallemand (France), president; Col. H. G. Lyons (England), general secretary; the presidents of the various sections are the vice presidents of the Union.

The opinion was expressed generally that in the *organization of work* for the various sections the endeavor should be to distribute the work among various committees rather than centralize the investigational work at the Central Bureaus.

At a preliminary meeting of the section on Meteorology, under the chairmanship of Col. Lyons, in the absence of Sir Napier Shaw, a brief discussion was held with regard to the work of the section. The general opinion was that

* A more detailed account is published in *Nature* (London), Aug. 14, 1919, pp. 464-466 (summarized in *Science*, Sept. 5, 1919, p. 226). A full account of the organization of the American section of this International Union of Geodesy and Geophysics is given in *Science*, Sept. 5, and 12, 1919, pp. 233-238, 255-259.

as the Meteorological Committee of Weather Bureaus must necessarily concern itself primarily with official and administrative matters, there would be abundant opportunity for useful work of the sections along broad investigational lines. Two general resolutions to the following effect were passed:

"That there be appointed a joint committee of the International Union of Astronomy and of the section of Meteorology of the International Geophysical Union for investigational work on solar radiation."

"That there be appointed a joint committee of the sections of Terrestrial Magnetism and Electricity, and of Meteorology, of the International Geophysical Union, for international work in atmospheric electricity."

The success of the meetings of the International Research Council and of the affiliated International Unions was, in no small measure, due to the indefatigable labors of Monsieur G. Lecointe, the well-known director of the Belgian Royal Observatory at Uccle, who had charge of the local arrangements. He was reelected a member of the Executive Committee of the Council and also one of the five vice presidents of the International Astronomical Union. On Saturday afternoon, July 26, in response to M. Lecointe's invitation, the astronomers and geophysicists visited the Uccle astronomical and geophysical observatories and were later entertained at the director's home.

## STEREOSCOPIC REPRESENTATION OF WIND MOVEMENT ALOFT.

By R. C. LANE and R. A. WELLS, Observers.

[Dated: Weather Bureau, Washington, Aug. 30, 1919.]

Prior to May, 1919, winds aloft had been represented by a series of charts, as explained in the MONTHLY WEATHER REVIEW, April, 1919, page 219, and figure 3, page 220. A separate map was constructed for each level for which a summary of the weather conditions was desired.

While that system of mapping is excellent to show a summary of the wind direction and velocity for any one level, it is inadequate for the busy forecaster. The data being distributed over six or eight maps are confusing when viewed as a whole, and it is equally difficult mentally to summarize the wind conditions aloft as set forth by such a series of maps in order to determine the turning of the wind aloft.

It was suggested by Maj. E. H. Bowie, Supervising Forecaster, that maps be prepared by piling arrows upon a post, the posts to be located upon a base-map indicating the location of each station, and the entire map to be photographed with a stereoscopic camera. The finished prints could be mounted upon cards and viewed through a stereoscope.

After a brief period of experimentation the present method was developed. Now, three elements may be represented on a single map, namely, wind direction, wind speed, and altitude above the surface of the earth.

Wind direction is represented to the nearest one of the 16 compass points, by setting the arrows, observing the top and bottom of the map as north and south, respectively. Wind speed or velocity is represented by the relative character on the head of the arrow. The principal characters used are the numerals from 0 to 8, inclusive, the relative values of which are given in the following table, in meters per second.

Scale of velocities for wind aloft map.

| Arrow character. | Representative value. | Arrow character. | Representative value. |
|---|---|---|---|
| 0 | Calm, less than 1 m/s. | 7 | 27 to 33 m/s. |
| 1 | 1 to 3 m/s. | 8 | Above 34 m/s. |
| 2 | 4 to 6 m/s. | M | Data missing. |
| 3 | 7 to 10 m/s. | C | Low clouds. |
| 4 | 11 to 15 m/s. | R | Raining. |
| 5 | 16 to 20 m/s. | S | Snowing. |
| 6 | 21 to 26 m/s. | | |

Altitude is represented by the length of the arrow and the position of the arrow on the post as set forth by the stereoscopic view. The longest arrow represents the surface, while the graduated shorter lengths represent, in meters, 250, 500, 1,000, 1,500, 2,000, 3,000, and 4,000, respectively, the length of the arrow decreasing with increase in altitude.

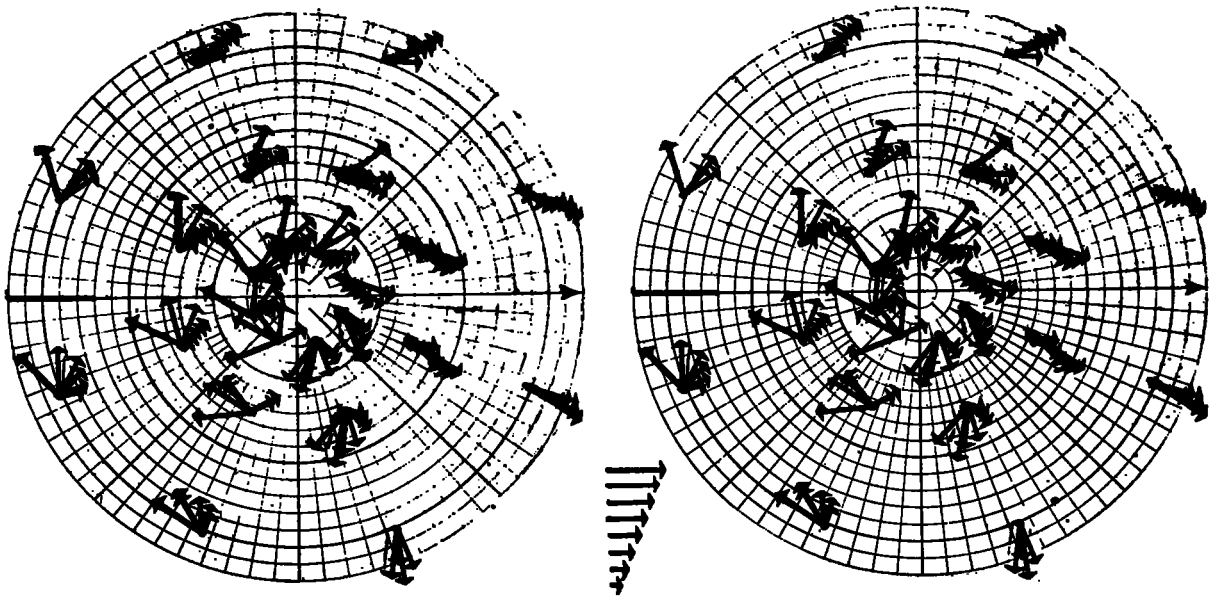

Fig. 1.—Average wind circulation aloft about HIGHS, as determined by W. R. Blair, at Mount Weather, Va. (Longest arrow, surface at 526 m.; next, 1,000 m.; shortest, 7,000 m.)